

Modifying Exhaust on Power Glide Phaeton Coaches with 2010 EPA Engines

Tiffin Motorhomes, Inc.

Work Instruction Number:

WI-291

Effective Date: 08/17/2015

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Purpose: To provide instructions on modifying the exhaust on *Power Glide Phaeton coaches with 2010 EPA Engines.*

TOOLS NEEDED:

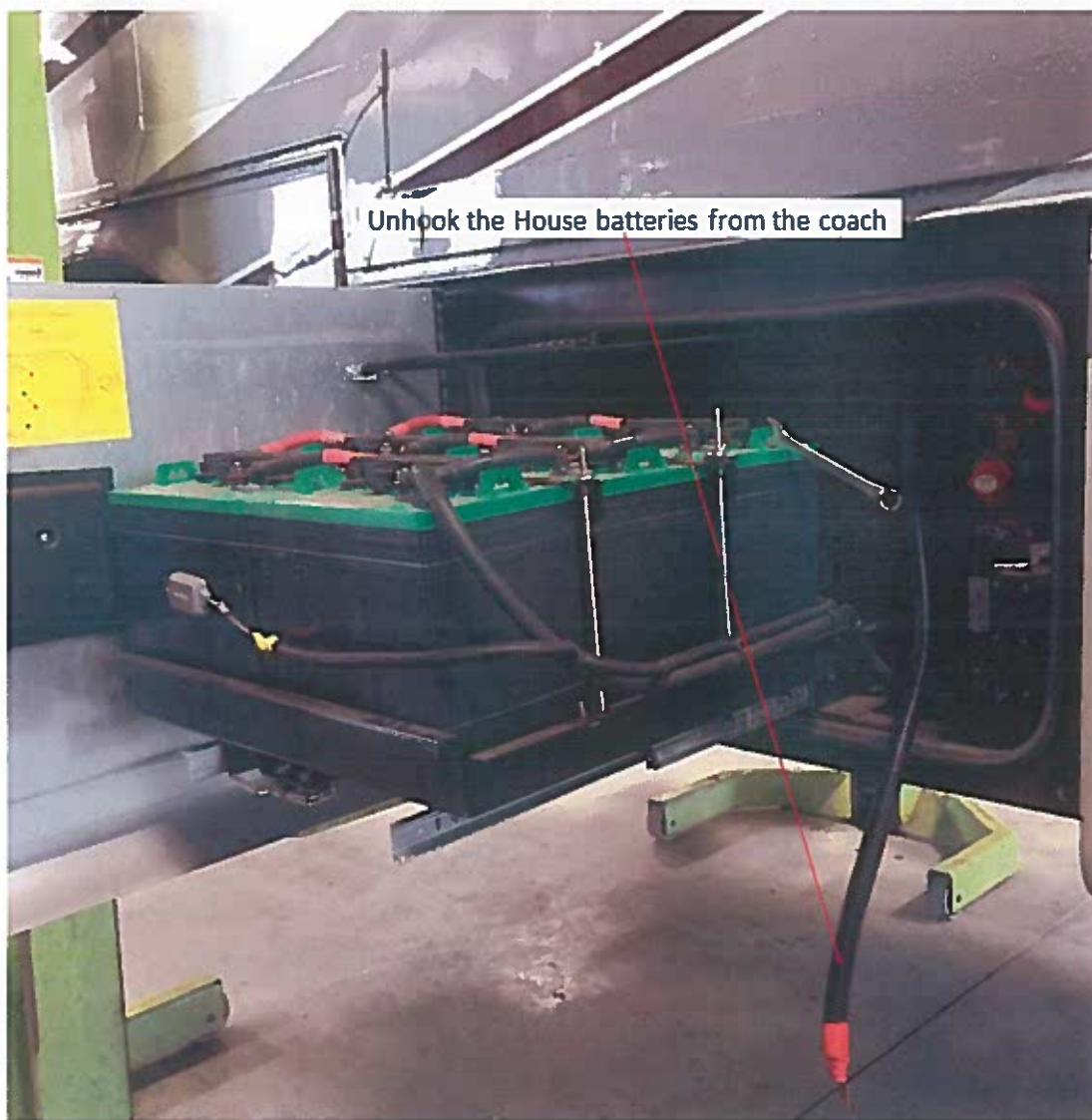
- 1- ½" Wrench
- 1- 14 mm Wrench
- 1- 15 mm Wrench
- 1- 9/16" Wrench
- 1- ½" Socket
- 1- Ratchet
- 1- Flat Headed Screwdriver
- 1- White Grease Marker
- 1- Framing Square
- 1- 2" Hole Saw
- 1- Grinder with Cutting Disks
- 1- 5/16" Hex Head Bit
- 1- Flat Head Bit
- 1- Welding Machine

PARTS NEEDED:

- 8- 5/16" Self Tapping Hex Head Screws
- 1- 4" Round 11GA Steel Plate
- 1- If Existing Gasket is Warn Cummings PT# = 2871452
- 1- New End Section of Exhaust Filter
- 1- New Exhaust Pipe
- 1- Upper Exhaust Hanger
- 1- Lower Exhaust Hanger
- 4- 3/8" X 2" Grade A Bolt
- 6- 3/8" X ¾" Hex Head Bolt
- 10- 3/8" Hex Head Lock Nut
- 1- 3" X 30 ¾" X 11 GA Steel Plate
- 3- Zip Tie
- 1- 12" 12V Cargo Bay Light Wire
- 1- 23" Engine Preheat Transfer Box Wire
- 1- 14" Telephone Wire
- 1- 12" X ½" Loom
- 1- 14" X ½" Loom
- 1- 23" X 1" Loom
- 8- 10/12 GA Jell Filled Butt Splices
- 4- 14/16 GA Jell Filled Butt Splices
- 1- Can of High Gloss Black Paint
- 1- Tube of Clear Silicone

Procedure:

- 1) Unhook the house batteries from the coach using a ½" wrench.



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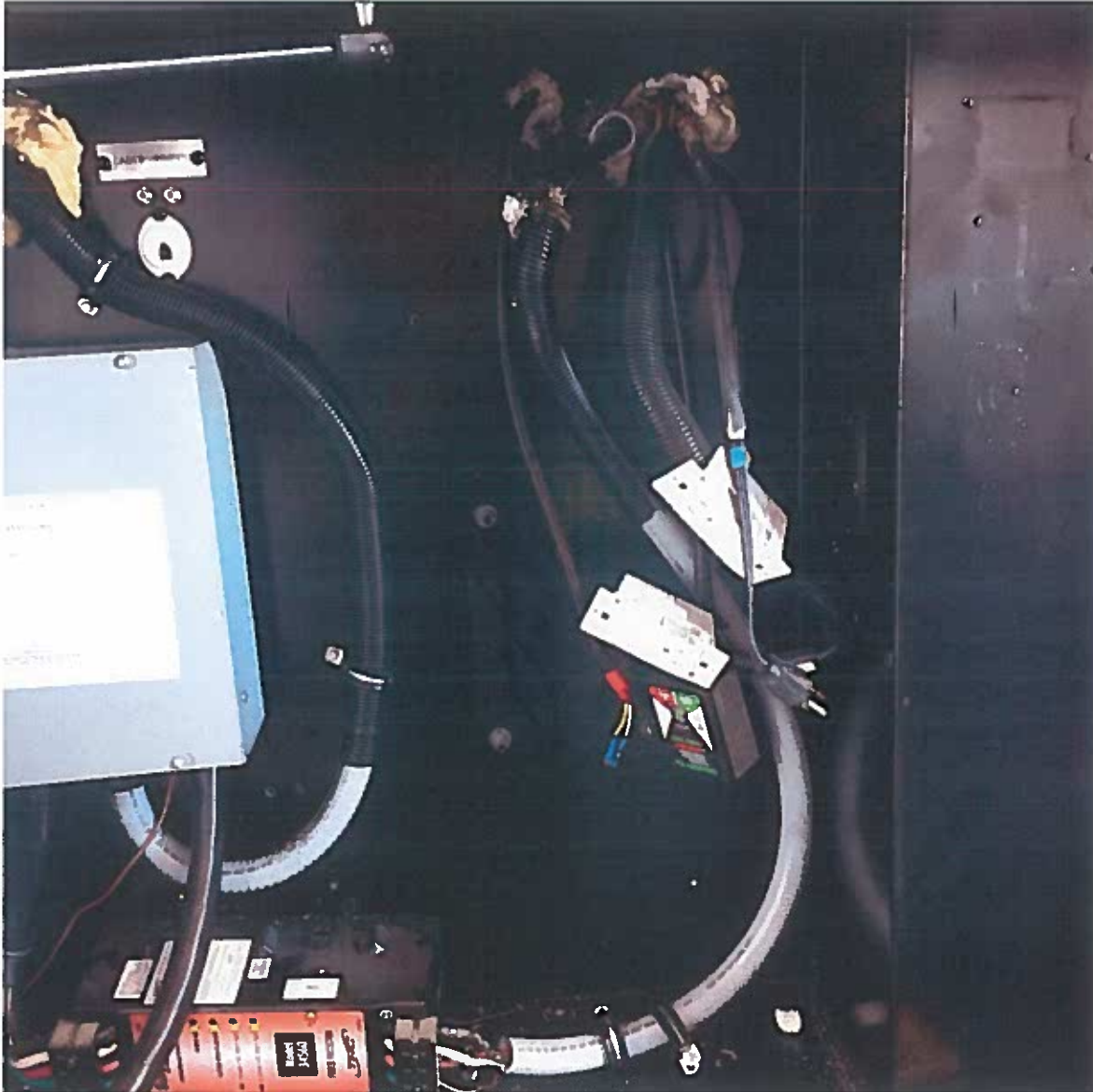
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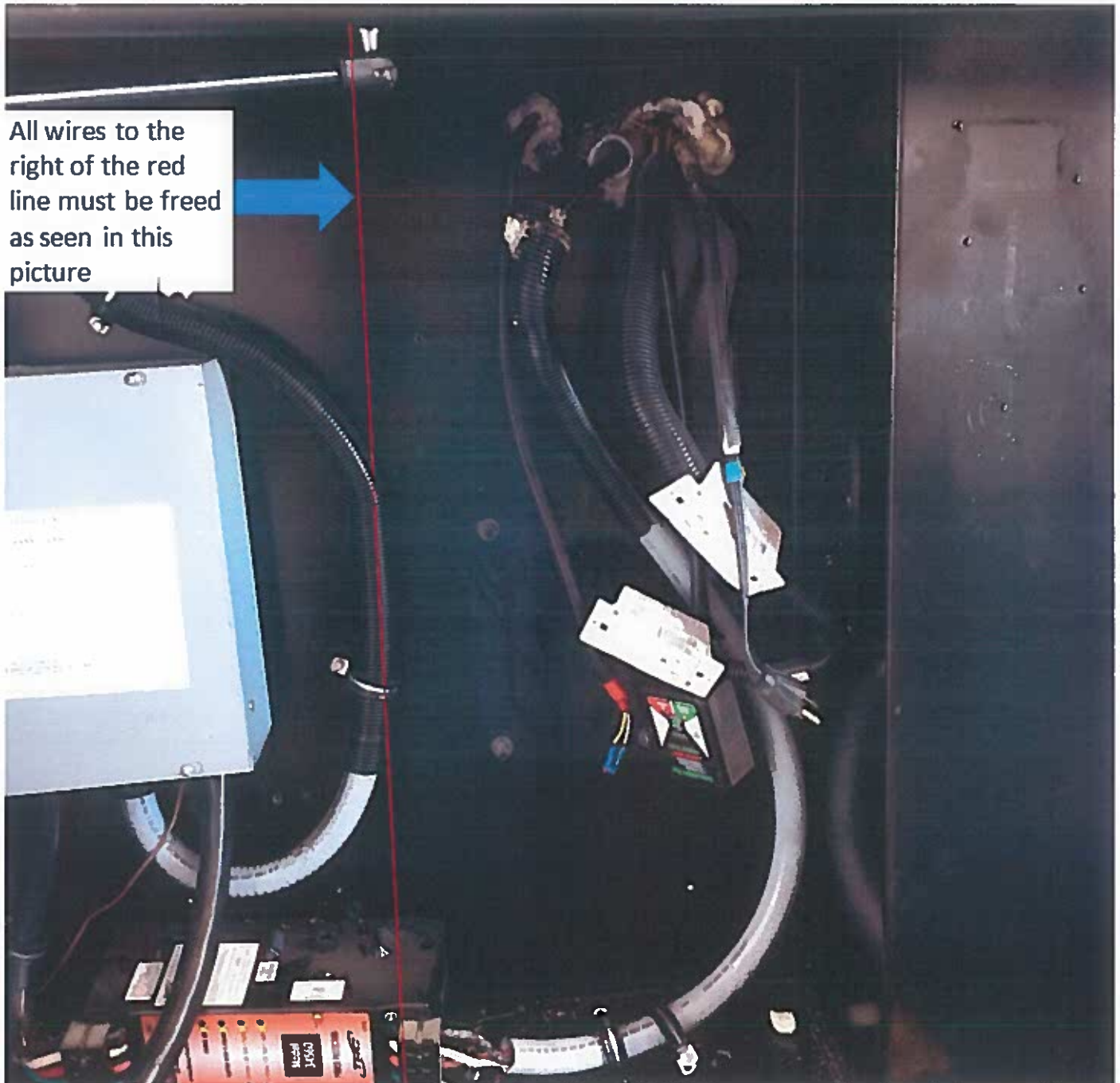
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- 2) Open the next to last cargo bay door on the driver's side. This should reveal the power cord for your motor home.



- 3) Unhook all attached items connected to the cargo bay wall right of the red line.



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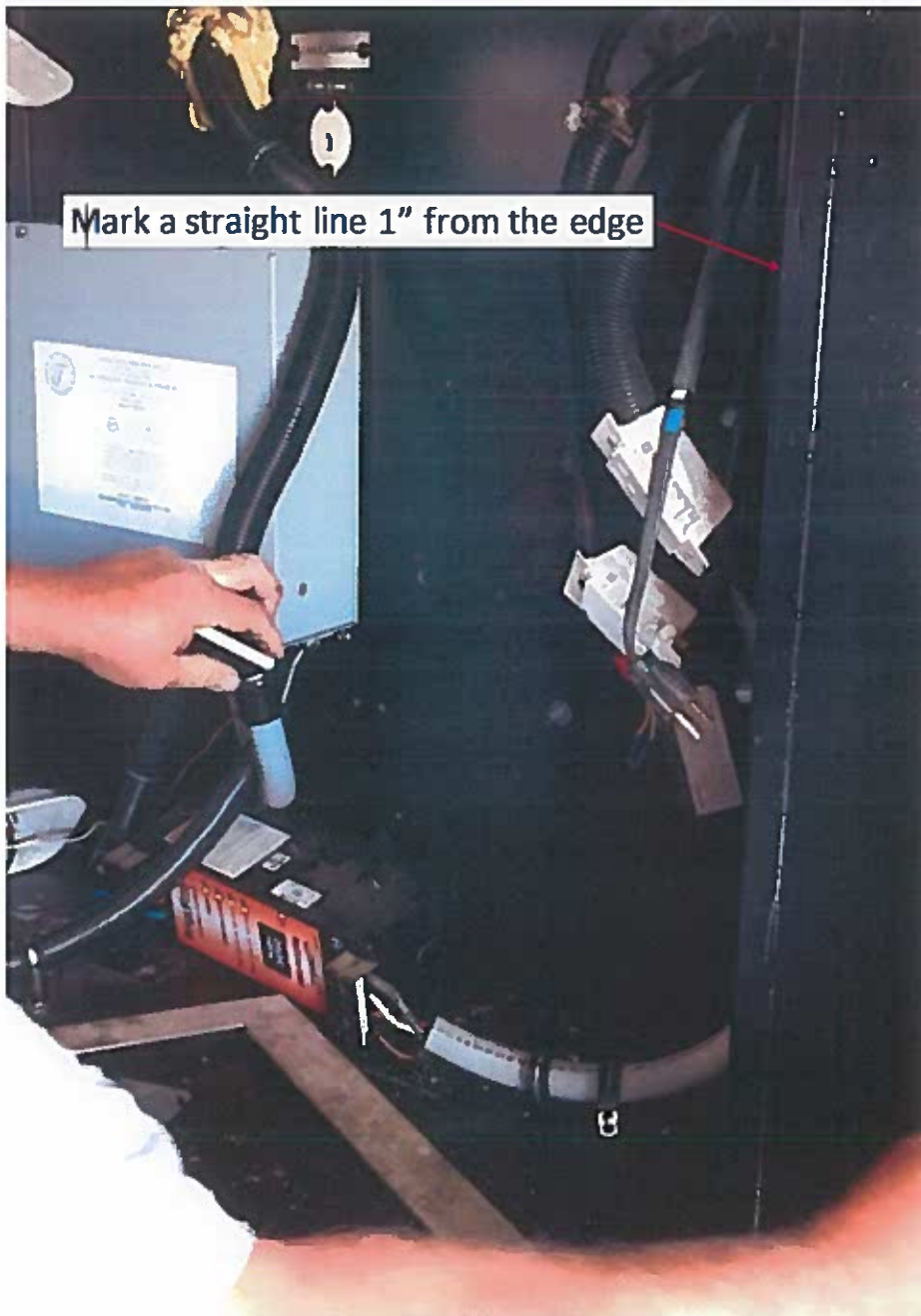
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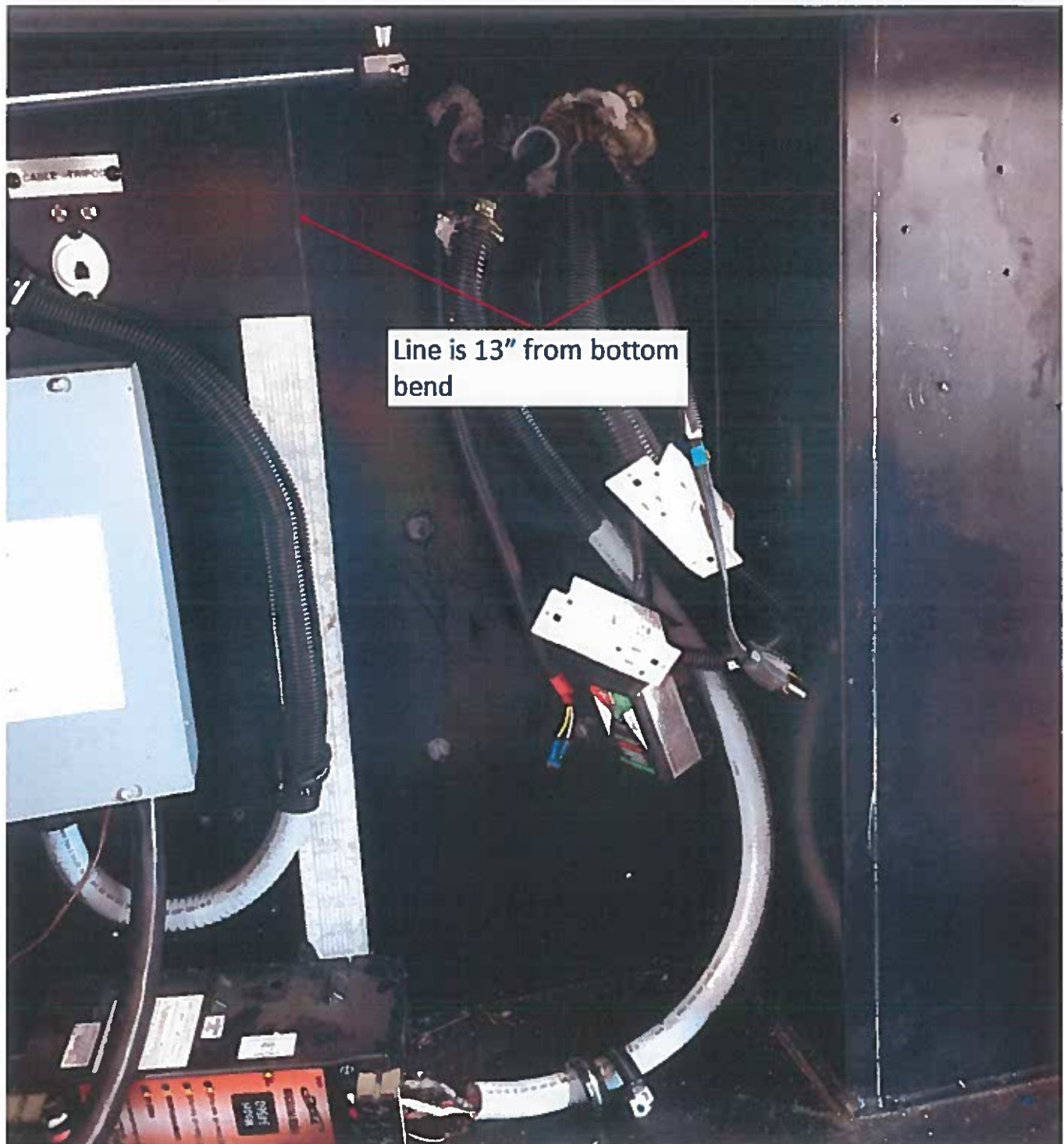
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4) Removing the Blank

- a) Using a white grease marker place a vertical line 1" from the bend in the sheet metal. This mark should not stop until it marks ¼" on the ceiling and the floor of the cargo bay box.



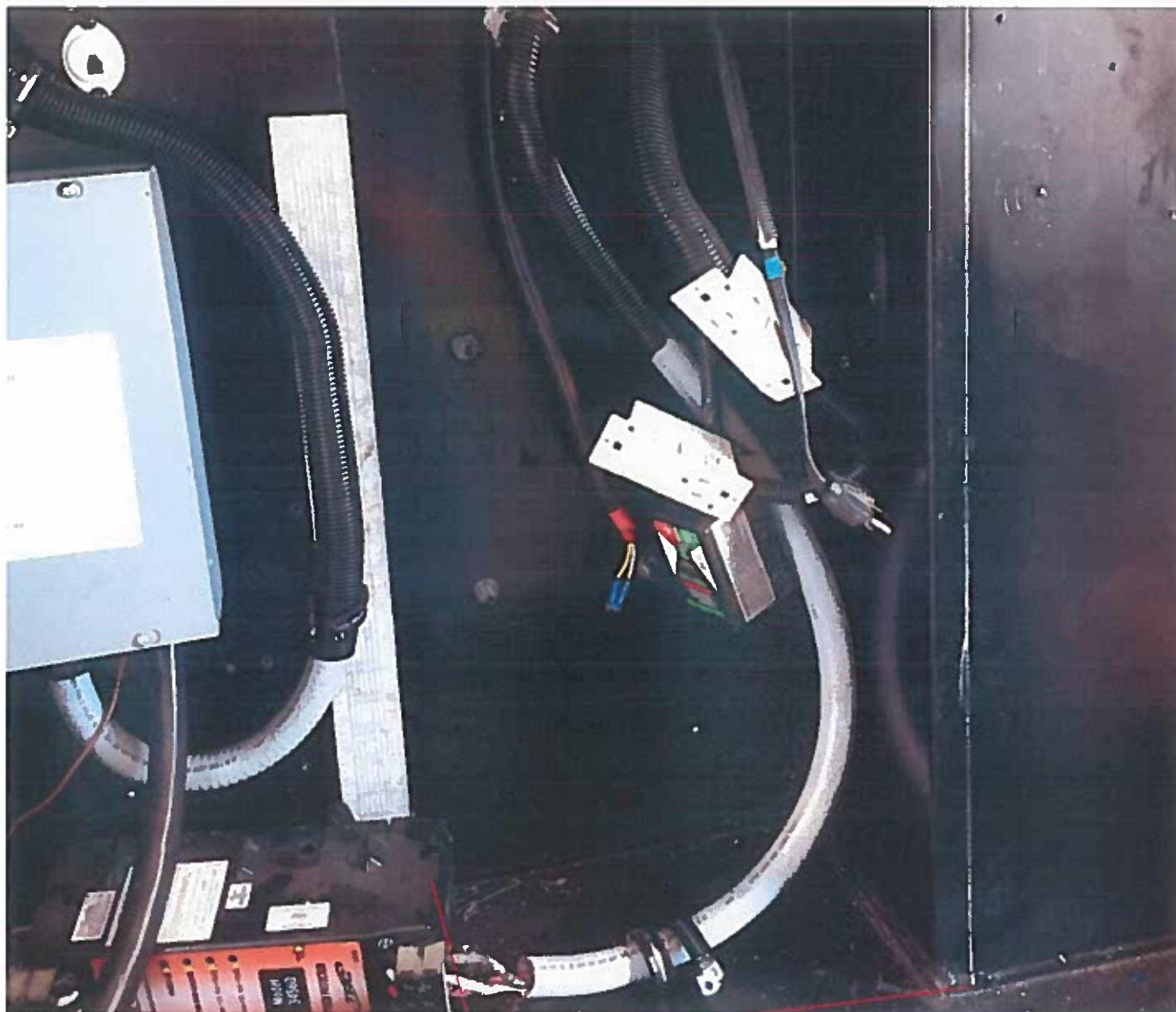
b) Make a mark the length of the box 13" to the left of the bottom bend.



- c) Using a grinder with a cutting disk cut the white lines. Look under the coach at the back side of the cargo bay. **Make sure there are no wires or hoses that could be cut during this step.**



d) Use a square to extend the lines that you cut in the previous step as seen below.



- e) Cut the lines made in the previous step. This should free the bottom of the sheet metal.



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- f) Push all wires back through the holes in the sheet metal piece you cut in the previous step.



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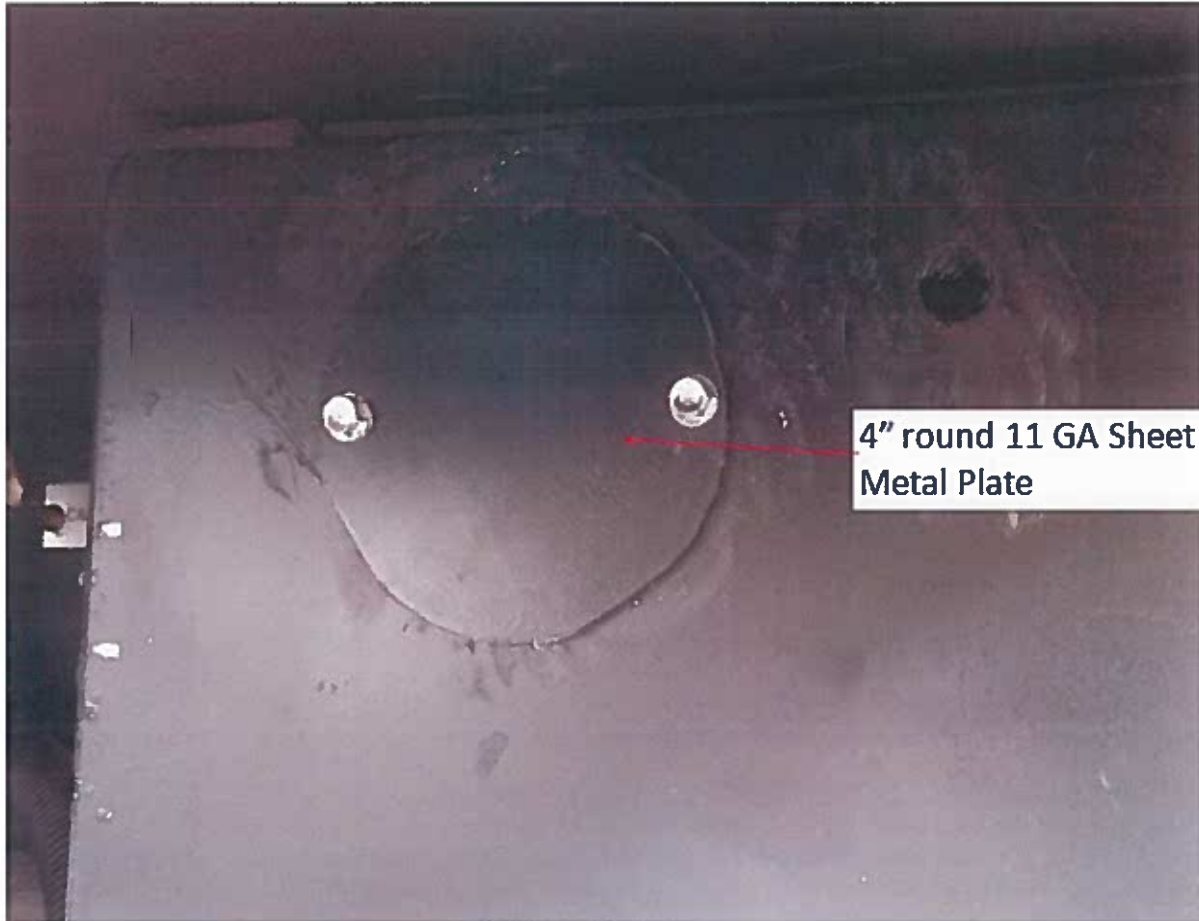
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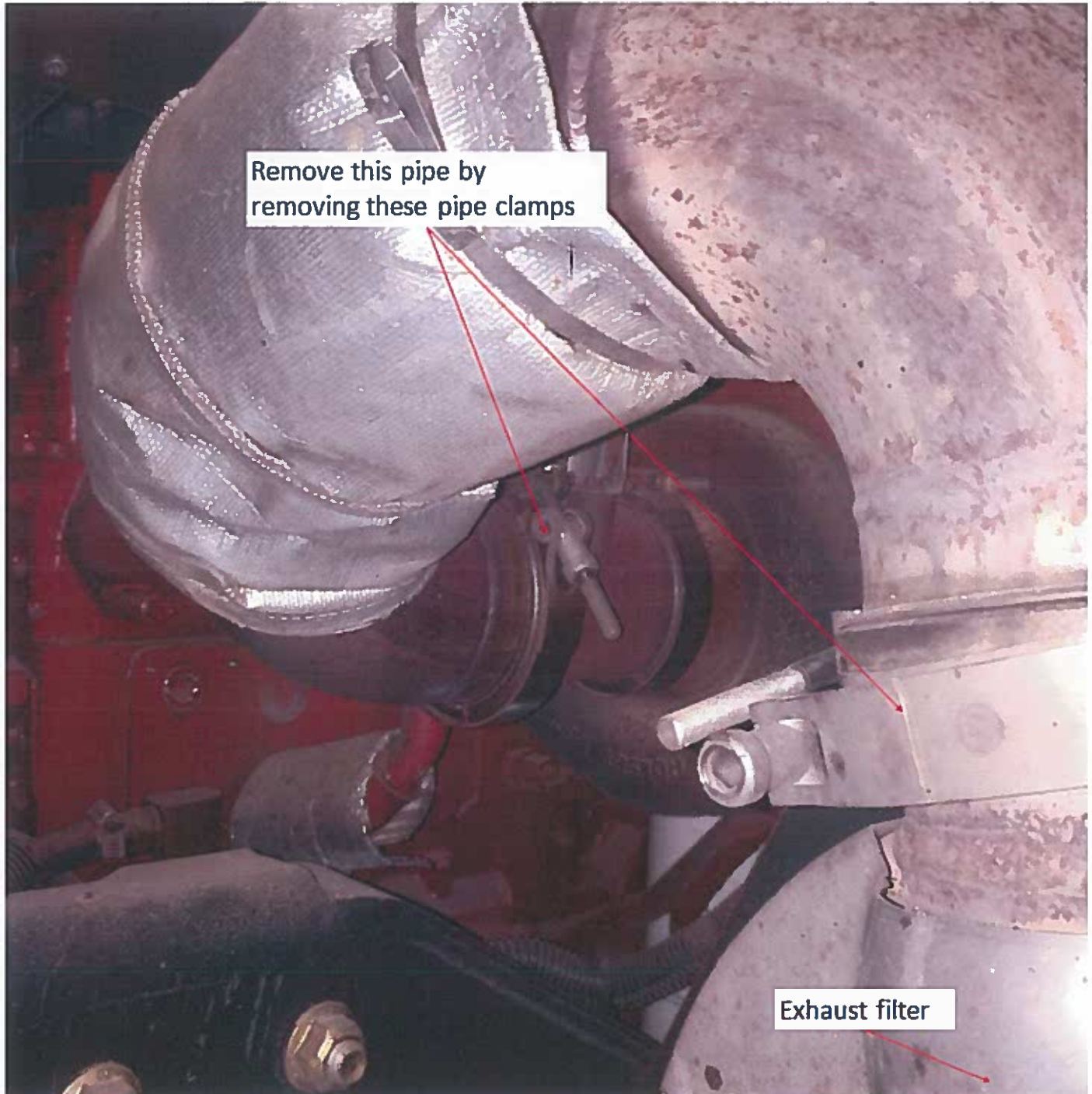
- g) Using a drill, a 5/16" hex head bit, and two 5/16" hex head self tapping screws; attach a 4" round 11GA sheet metal plate over the original wire hole.



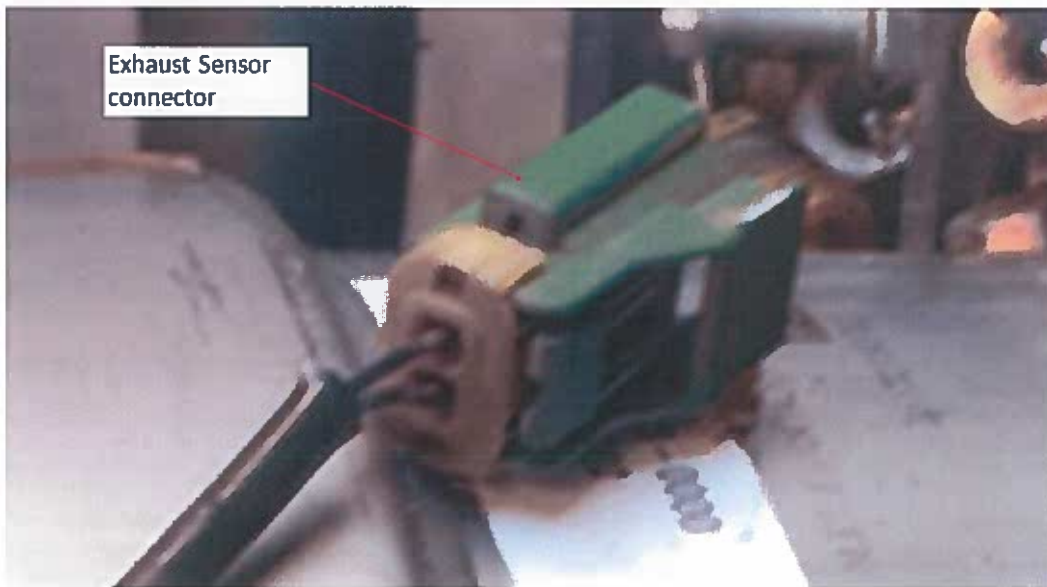
4" round 11 GA Sheet
Metal Plate

- h) Remove the Blank.

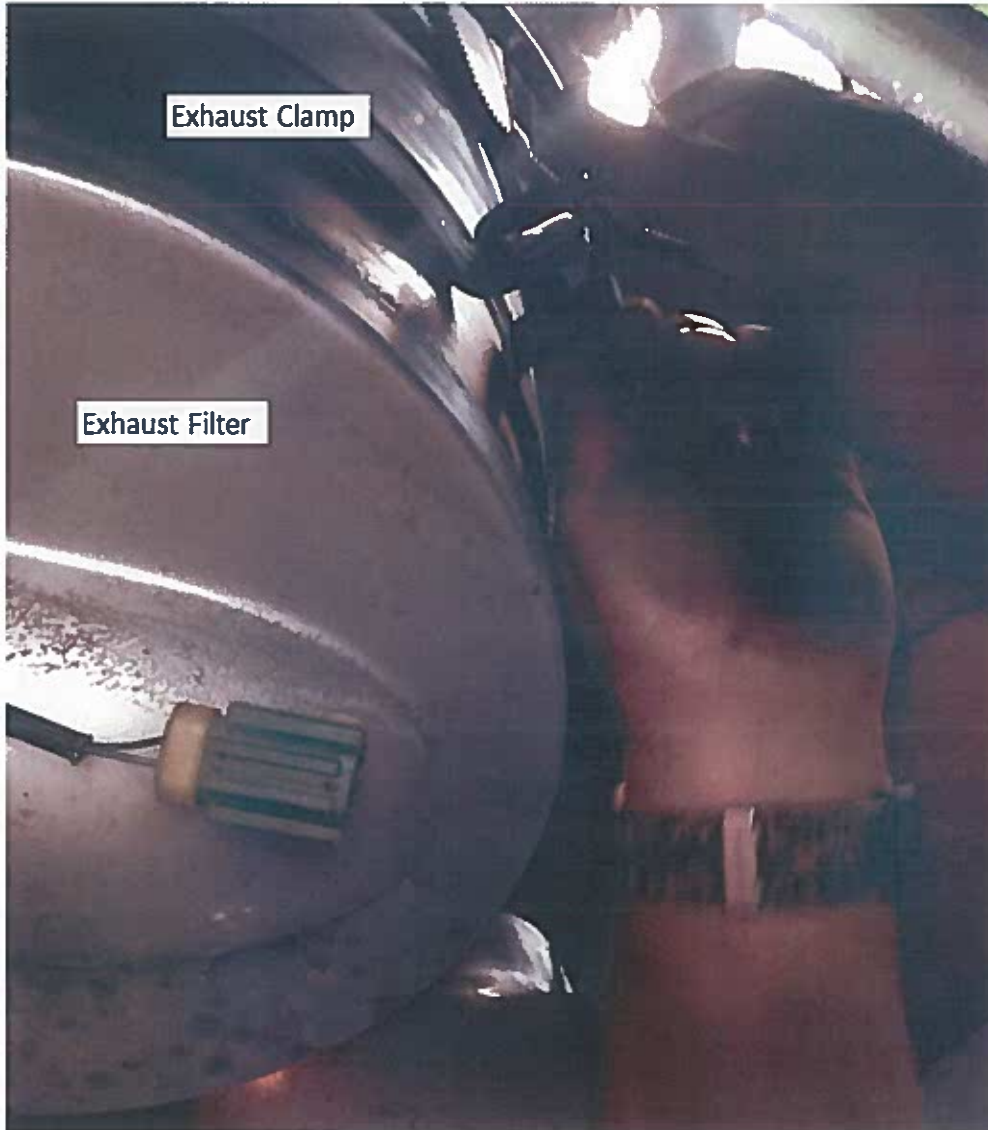
- 5) Using a ratchet and a 1/2" socket remove the two exhaust clamps attached to the exhaust pipe between the filter and the Turbo. Remove the pipe that was freed in this step.



- 6) Trace the exhaust sensor cable back until you find a connection seen in the second picture. Unhook the connection.



- 7) Using a ratchet and a 1/2" socket remove the exhaust clamp attached to the end of the exhaust filter and the exhaust filter hanger.

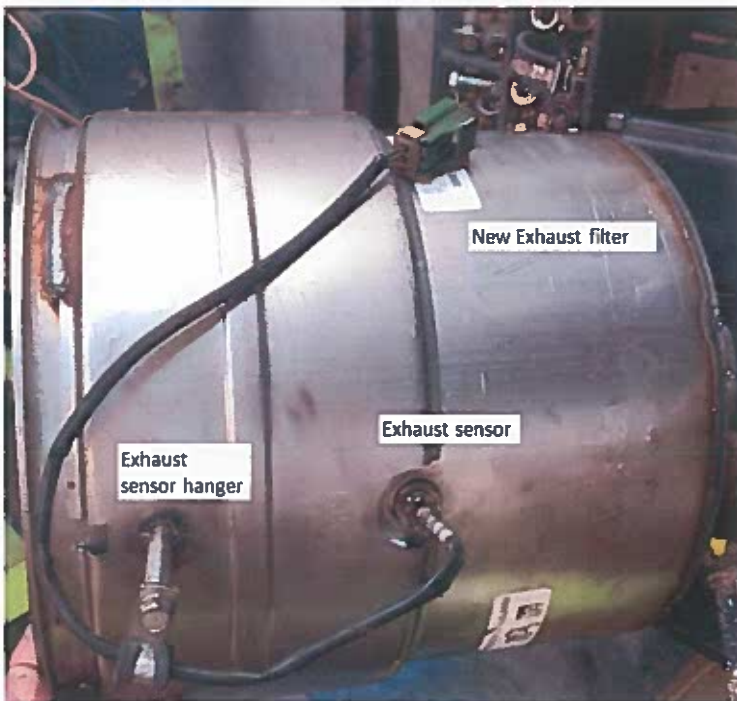


- 8) Remove the end of the exhaust filter and the gasket.

- 9) Inspect the gasket Cummings PT# = 2871452 for tears. If it is worn it must be replaced. If it is in good condition place it aside for now.



- 10) Using a 14 mm wrench attach the exhaust sensor to the new end section of the exhaust filter. Using a 9/16" wrench attach the exhaust sensor hanger to the new end section of the exhaust filter.



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- 11) Place the gasket on the large opening of the new filter.



- 12) Place the new exhaust filter in the same location as the exhaust filter you removed. Be sure to set the new end section of the exhaust filter so that the sensor is pointing up.



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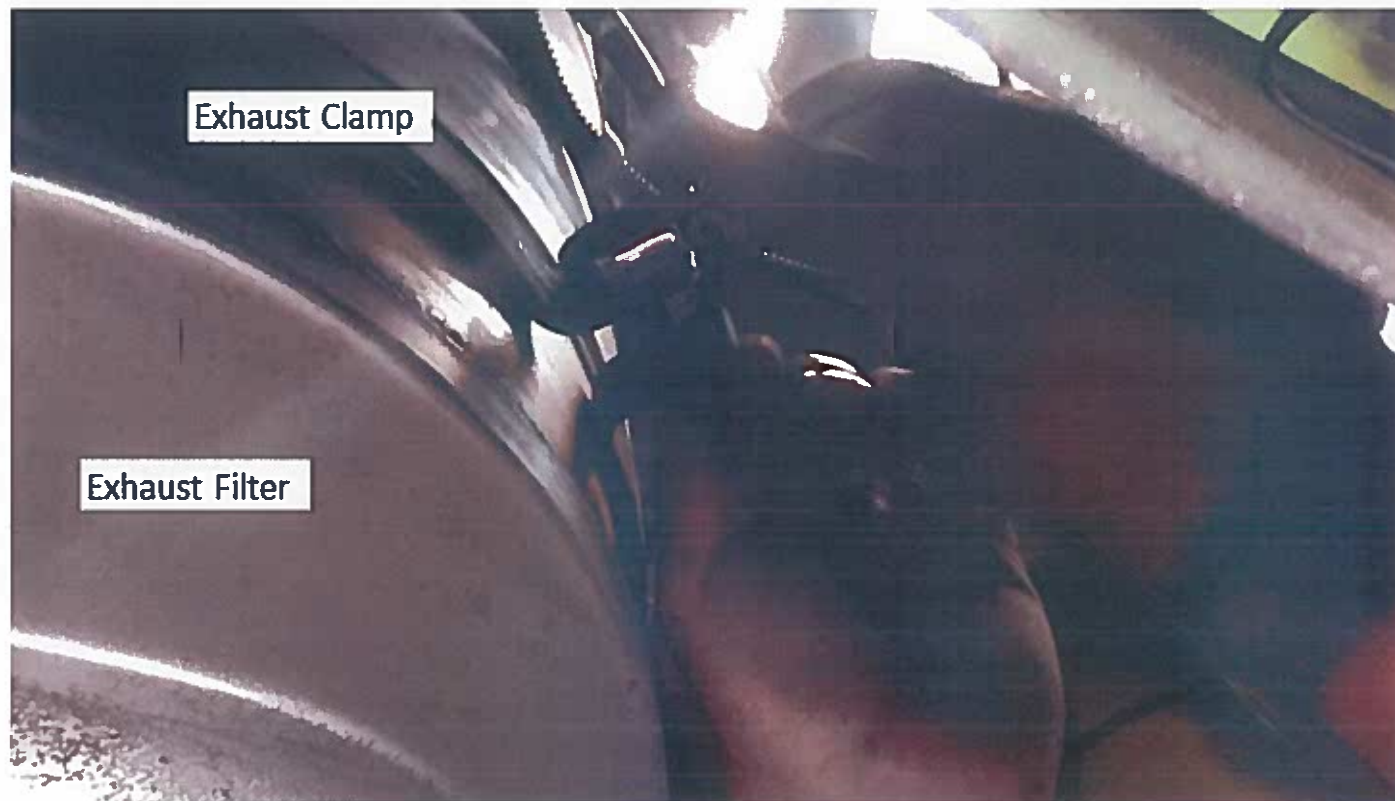
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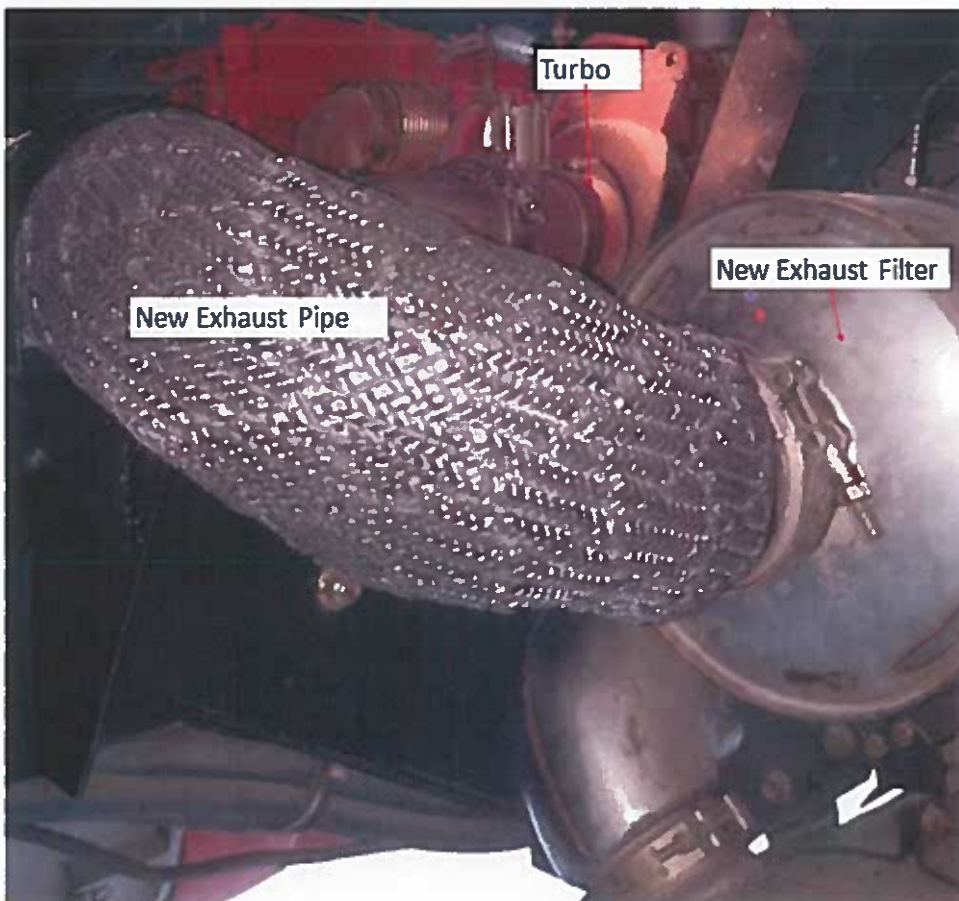
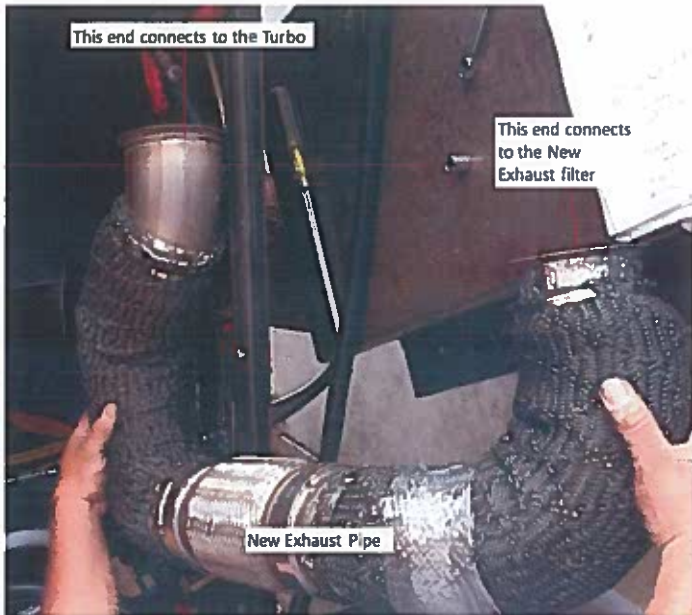
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- 13) Using a ratchet and a 1/2" socket attach the exhaust clamps and the hanger to the new exhaust filter. Reattach the exhaust sensor cable connector.



- 14) Using a ratchet, 1/2" socket, and an exhaust clamp to attach one end of the new exhaust pipe to the Turbo and the other end of the exhaust pipe to the new exhaust filter using the second exhaust clamp.



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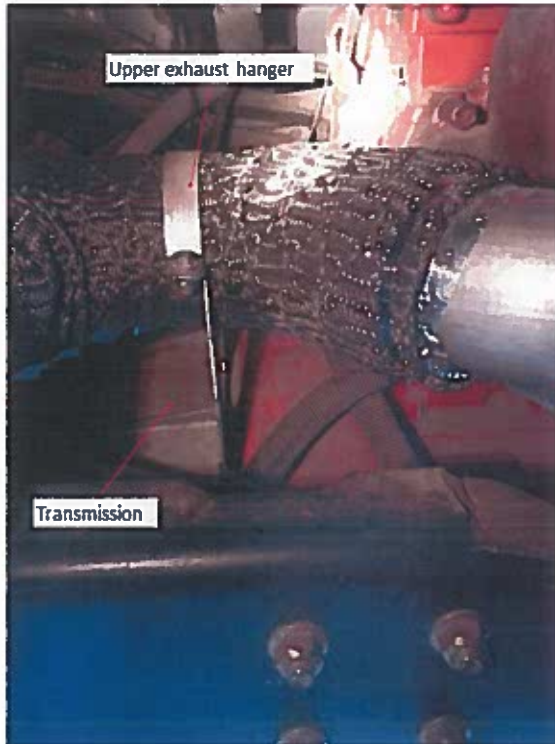
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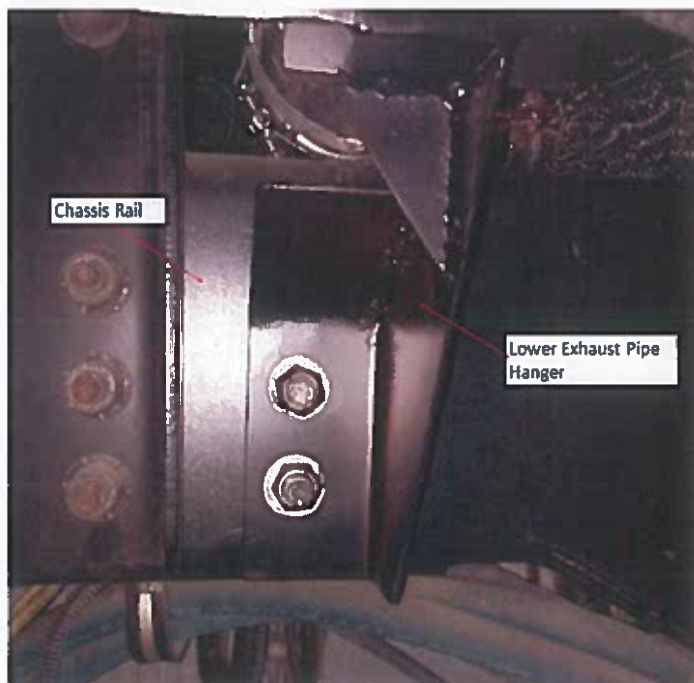
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- 15) Using a 15 mm wrench attach the upper exhaust pipe hanger to the transmission. No bolts are needed use the existing bolts in the transmission.



- 16) Bolt the lower exhaust pipe hanger to the chassis rail using a ratchet, 1/2" socket, two 3/8" grade 8 bolts and two 3/8" lock nuts. Attach the lower hanger to the exhaust pipe.

Remember the pipe should not touch the chassis rail.



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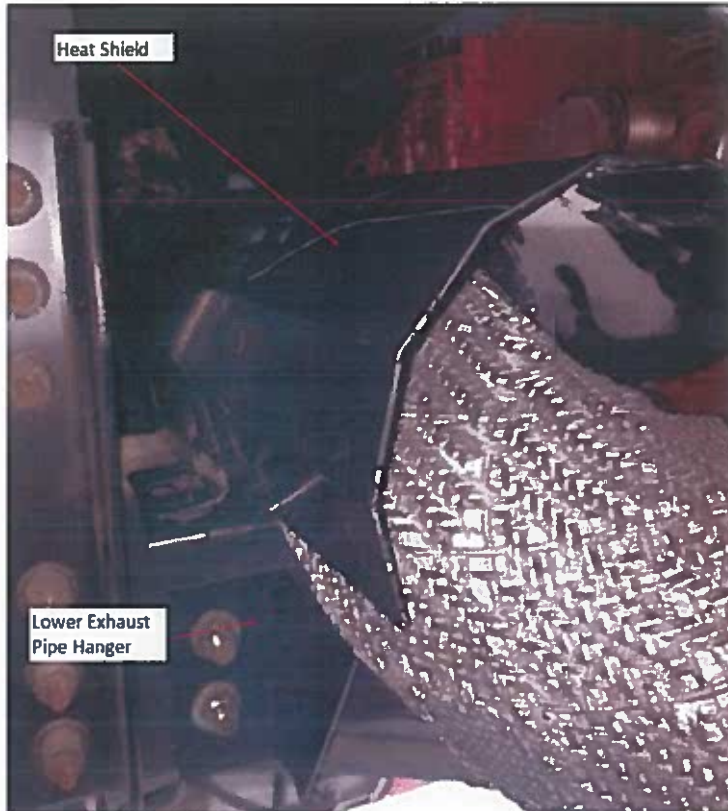
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- 17) Attach the heat shield to the lower exhaust pipe hanger using a ratchet, 1/2" socket, one 3/8" bolt and one 3/8" lock nut.



- 18) Using a grinder remove the bolt studs from the blank.



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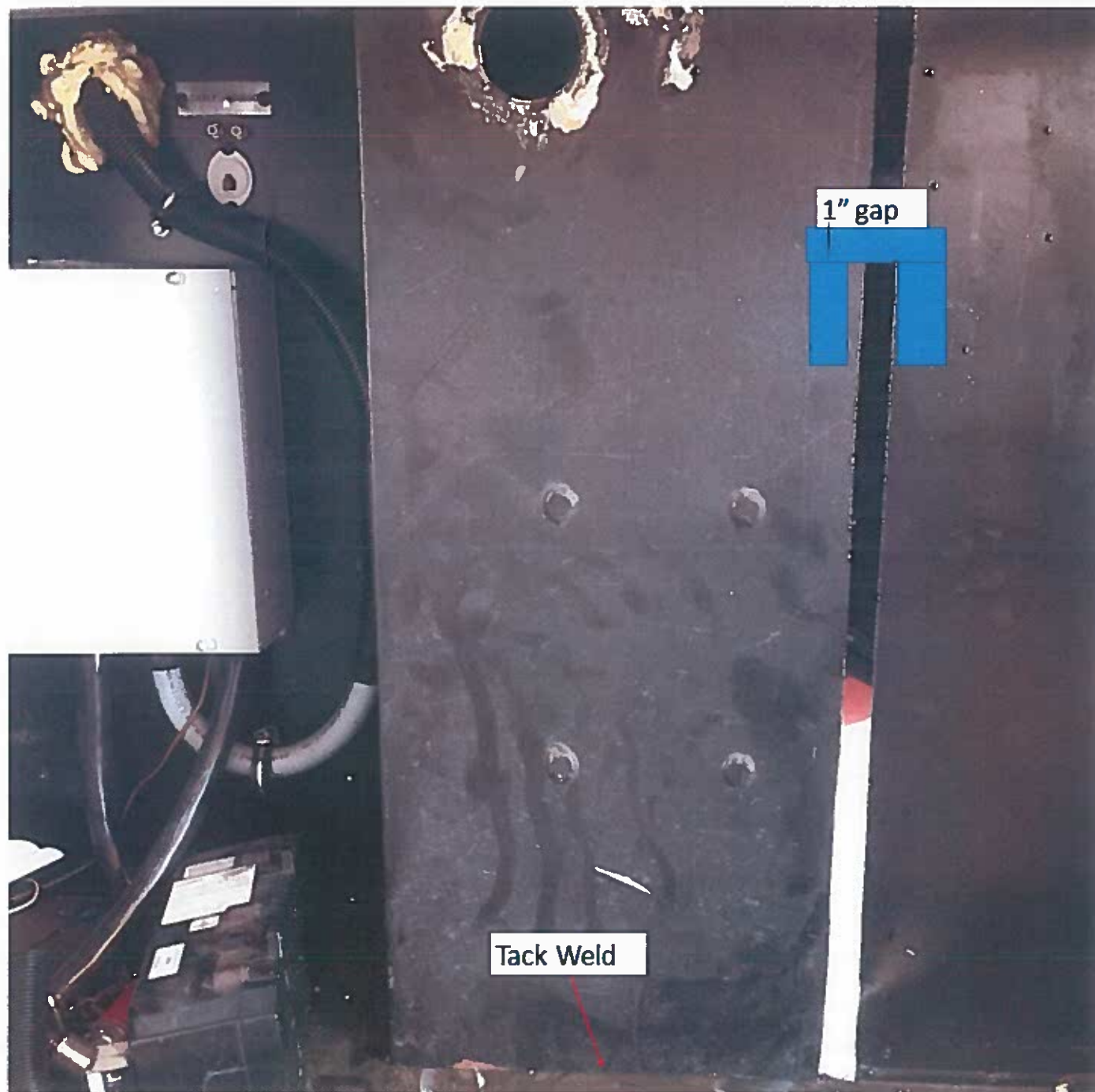
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- 19) Weld a 3/8" X 3/4" bolt in each hole. Make sure the bolts are pointing in the opposite direction as the studs removed in the previous step.



- 20) Place the blank in the hole as seen below.
- 21) Using a welding machine tack weld the blank in place, then weld the base of the blank in place.



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- 22) Use a drill, a 5/16" hex head bit, and two 5/16" hex head self tapping screws to hold the flange of the blank in place. On the back side stitch (on outside of box) weld the seam 1" on 12".



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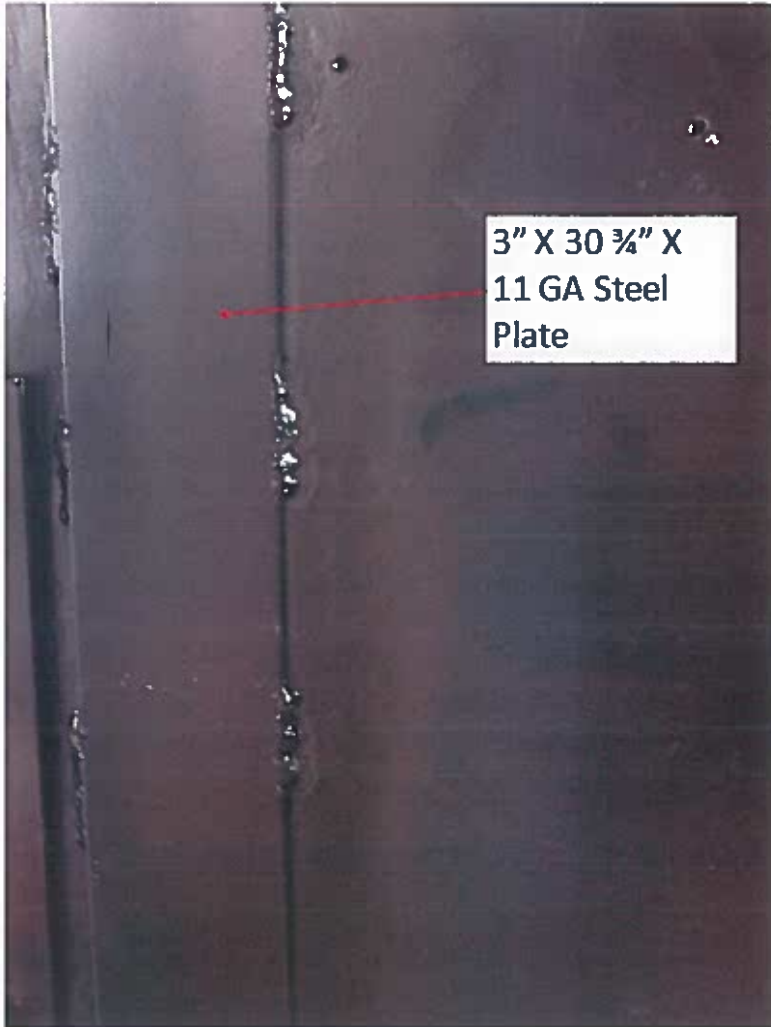
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- 23) Place a 3" X 30 3/4" X 11 GA steel plate over the hole. Stitch weld the strip in place 1" on 10".



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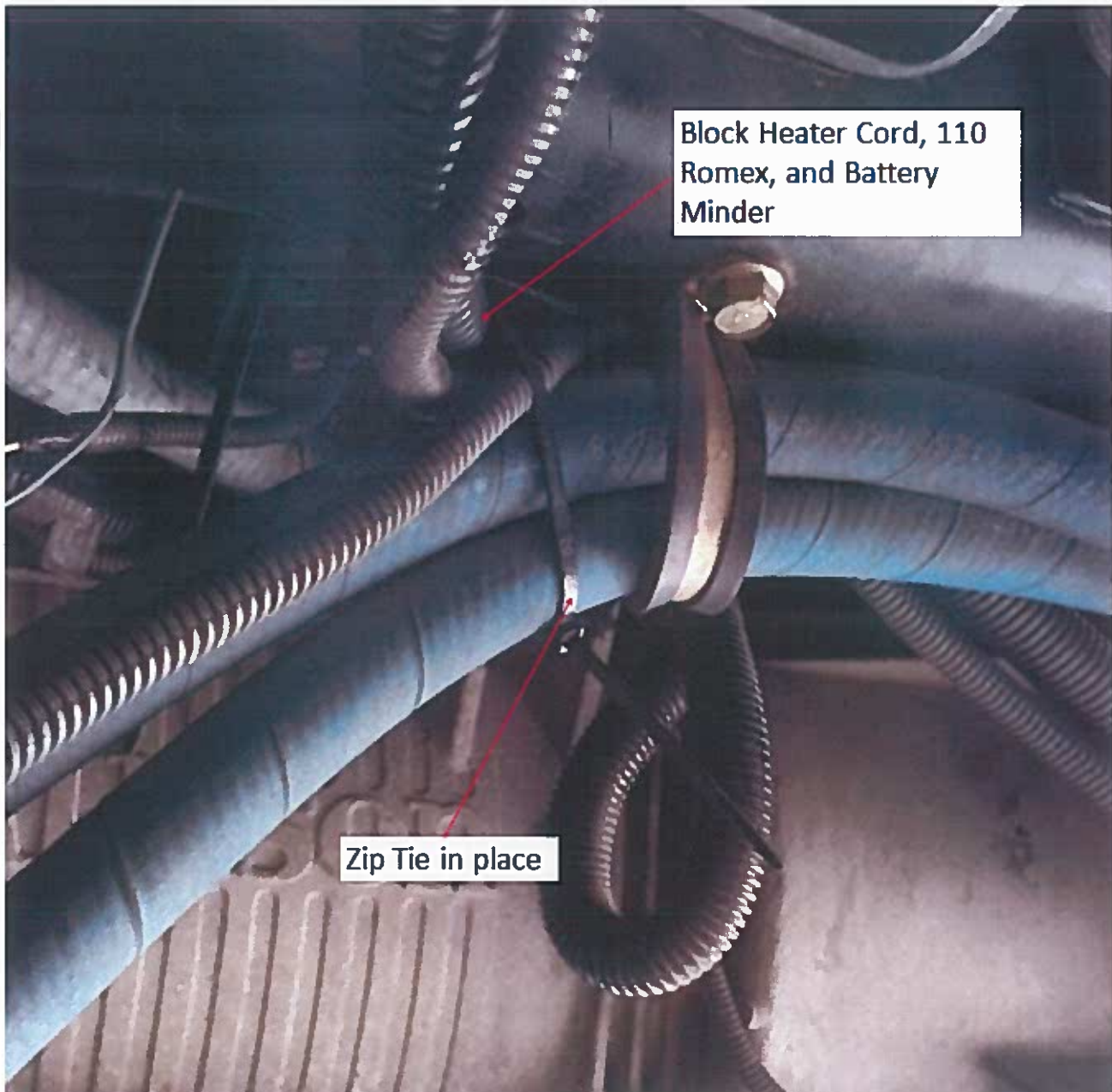
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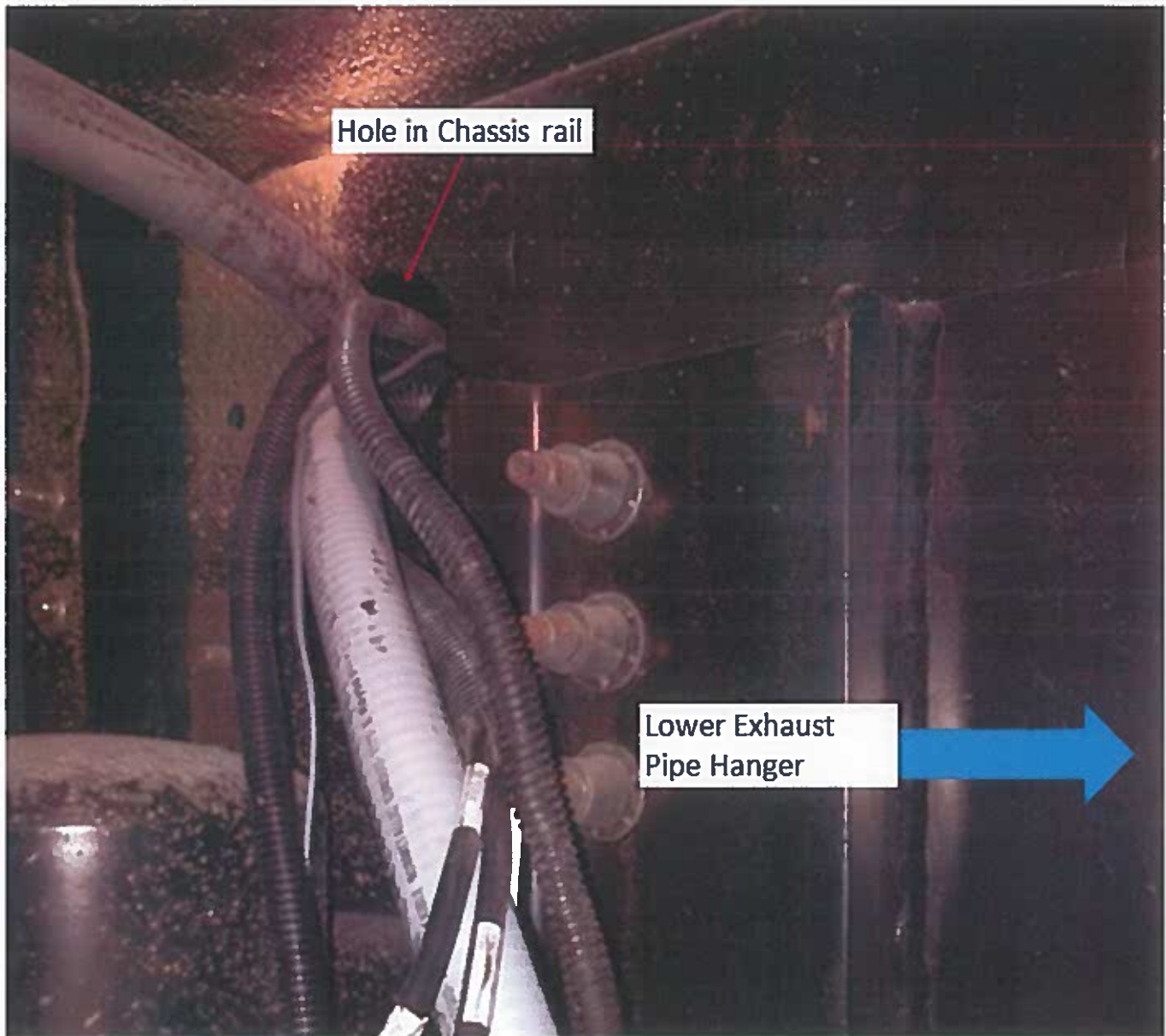
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24) Routing the wires and cables.

- a) Reroute the block heater cord, the 110 Romex to the plug, and the battery minder wires under the rail. Use a Zip tie to hold the wires in place. The wires should be no further than 1" away from the transmission. This is to ensure the maximum distance between the wires and the exhaust. Remember wires cannot touch the transmission near the drive shaft.



- b) Reroute the remainder of the wires affected in this change so they pass through the hole in the chassis rail seen in the picture below. Remember wires cannot touch the transmission.



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- c) Using a 2 ½" hole saw, drill a hole in the sheet metal 16" from the bottom of the cargo bay as seen below.



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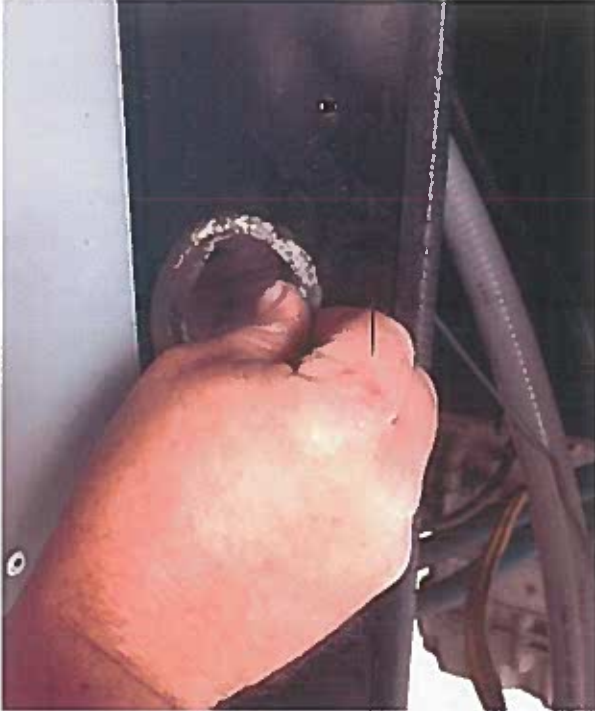
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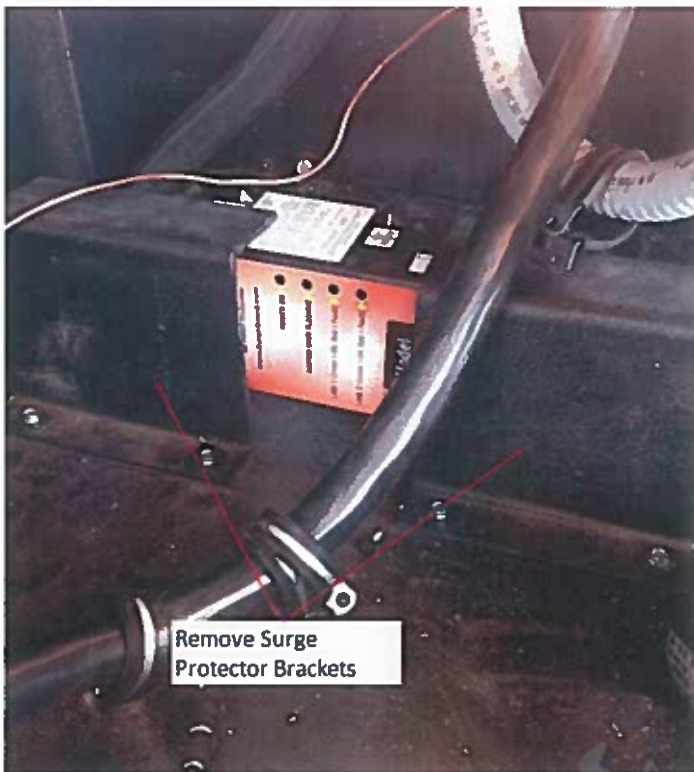
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- d) Remove the grommet from the hole that wires went through previously, and place it in the hole drilled in the previous step.



- e) Using a 5/16" hex head bit and drill, remove the surge protector brackets.



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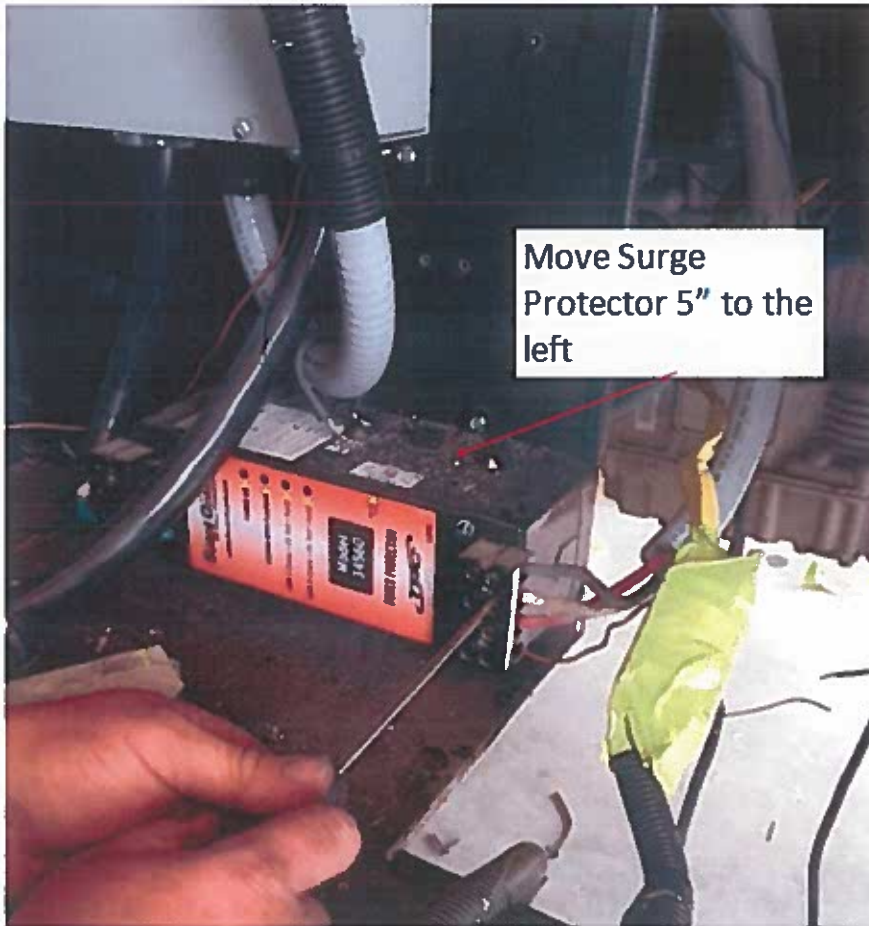
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- f) Using a flat headed screw driver disconnect all wires attached to the surge protector.
- g) Relocate the surge protector 5" to the left of its original location.



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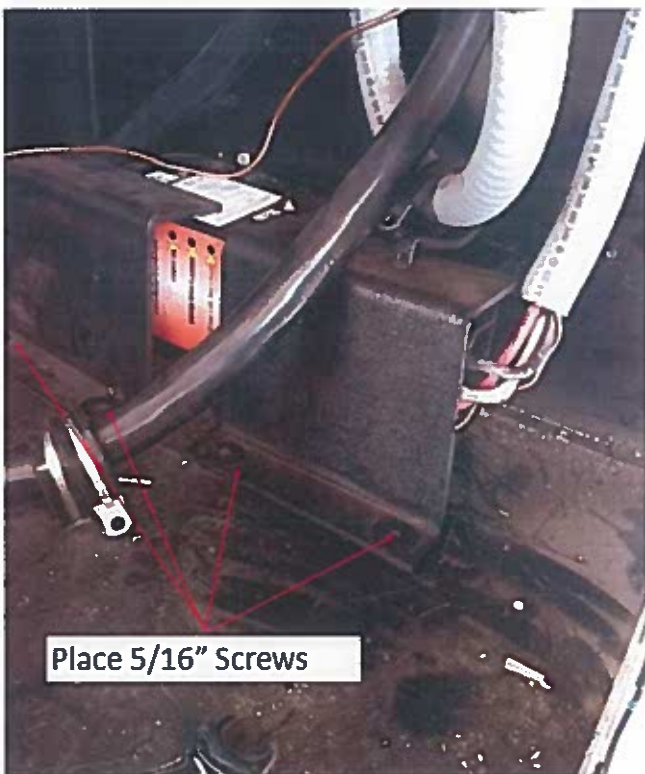
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- h) Rout the Gray conduit through the hole with the grommet.



- i) Using a 5/16" hex head bit, drill, and four 5/16" self tapping hex head screws place the surge protector brackets around the surge protector.



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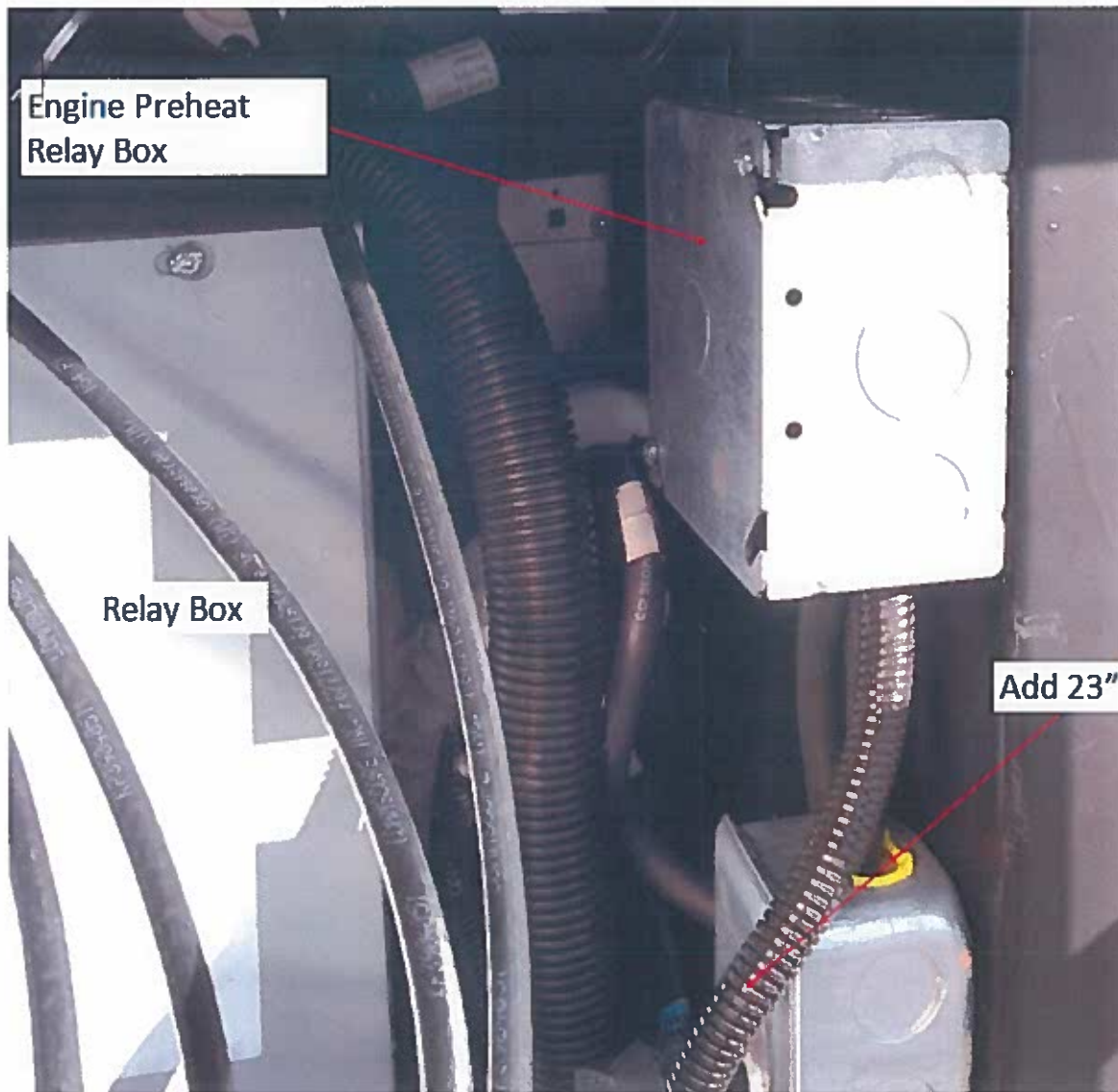
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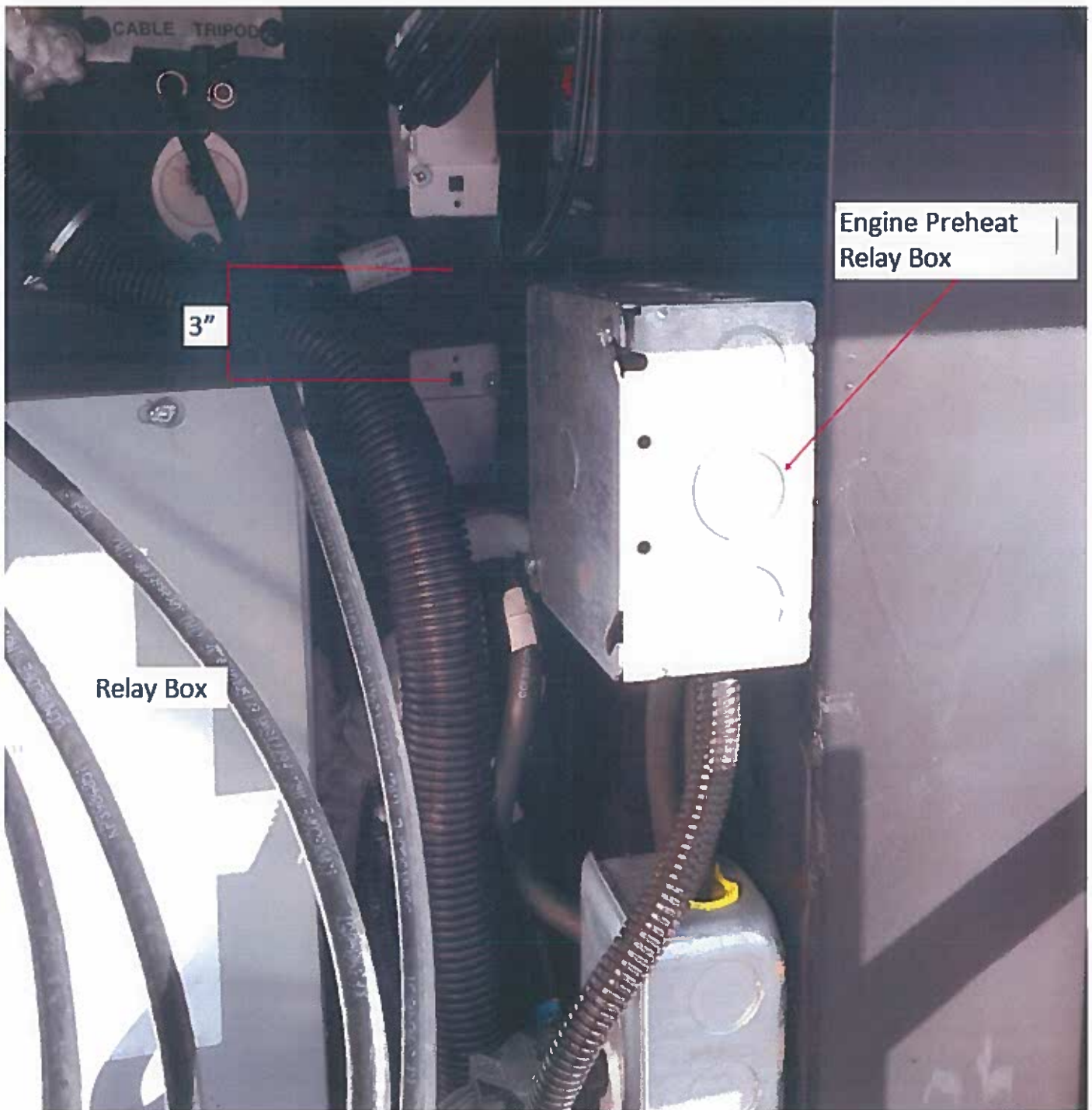
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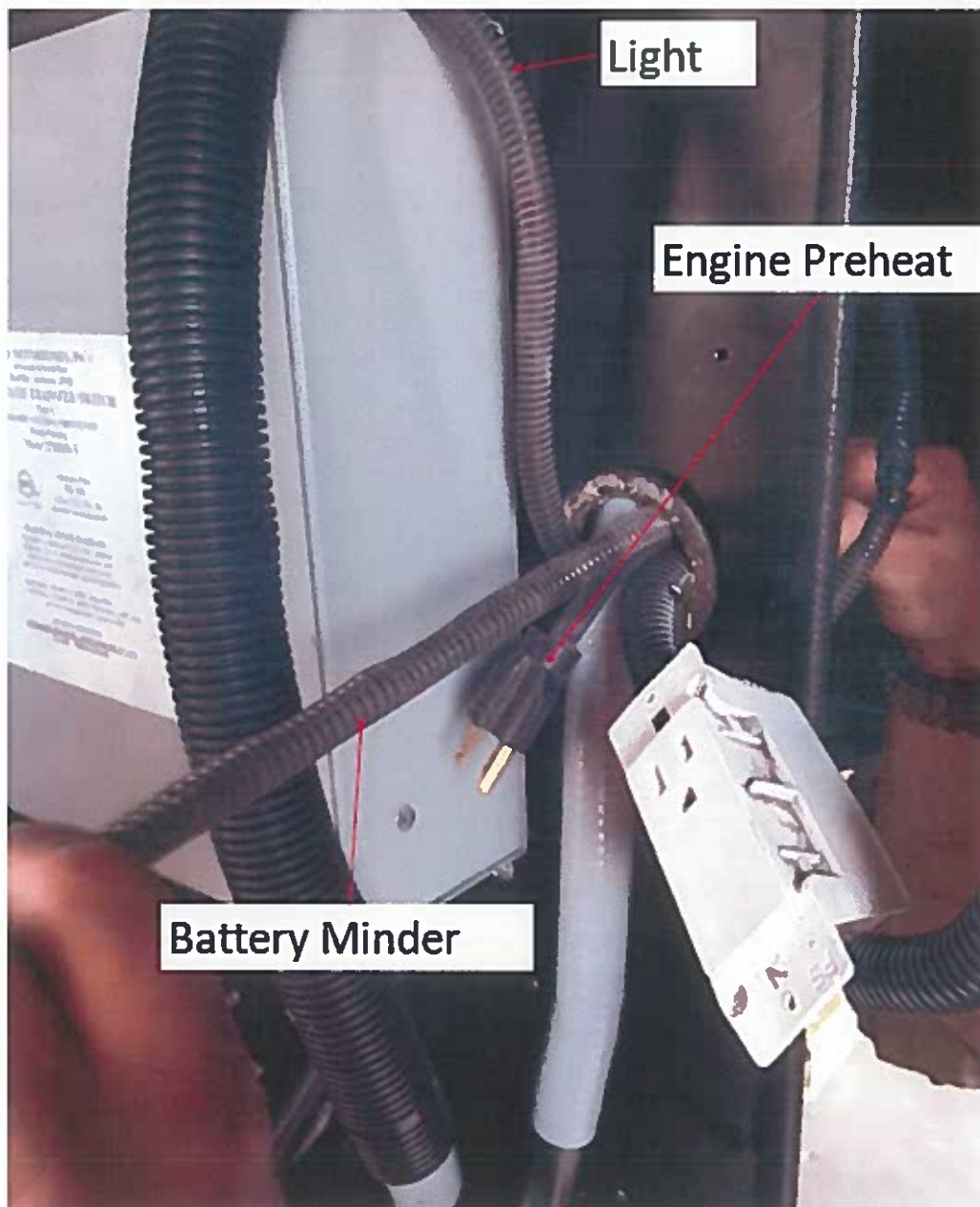
- j) Add 12" of wire and 12" of loom to the 12V cargo light wire using two 10/12 GA jell filled butt splices.
- k) Add 12" of wire and 12" of loom to the engine preheat wire using three 10/12 GA jell filled butt splices
- l) Add 14" of phone wire and 14" of loom to the phone wire using four 14/16 jell filled butt splices.
- m) Add 23" of to the engine preheat transfer box wires using 23" of 1" loom and three 10/12 jell filled butt splices as seen below.



- n) Attach the engine preheat relay box to the blank 3" higher than the relay box as seen below.



- o) Rout the cargo bay light cord, engine preheat cord, battery minder cord and the 110V outlets through the hole with the grommet you placed in a prior step.



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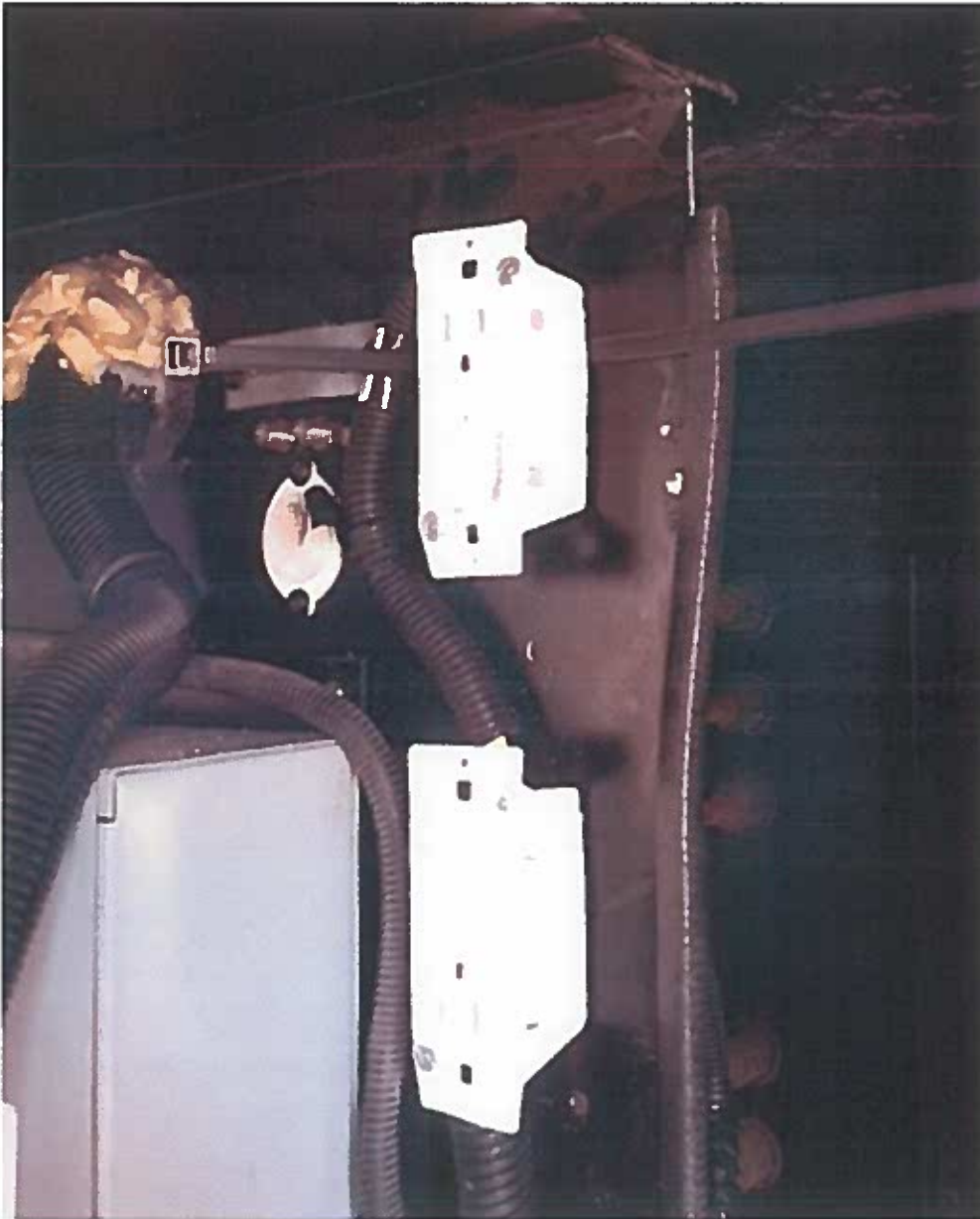
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- p) Place a zip tie behind the top 110 outlet. Use a drill and a flat head bit to attach the 110 outlets to the wall as seen below.



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- q) Plug the battery minder into the 110V plug. Use a zip tie to secure the plug as seen below.



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- r) Wire the cargo bay light back up. Using the screws that held the cargo bay light in place secure the cargo bay light as seen below, then secure the wire using a p clamp.



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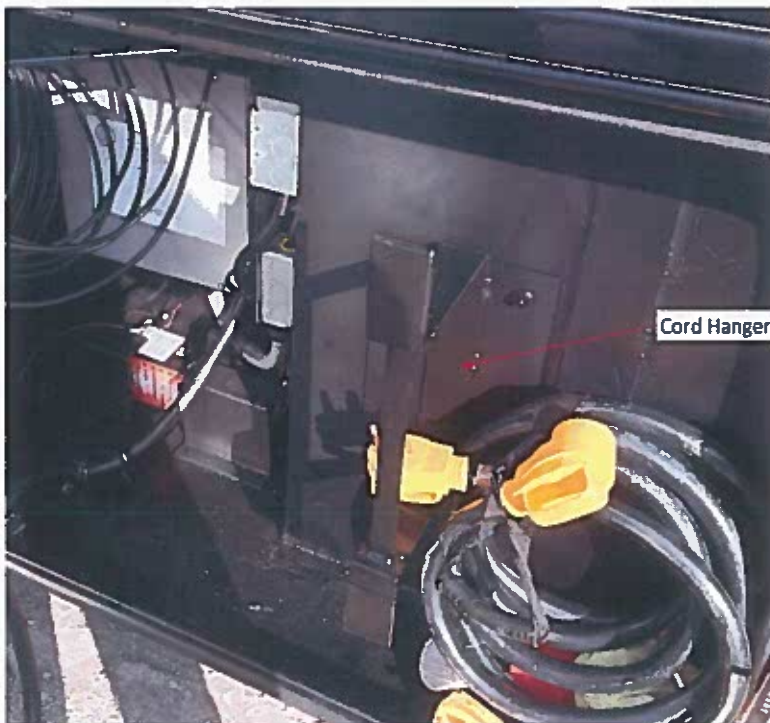
- 25) Using a grinder and cutting disk cut a 1 ½" piece out of both sides of the cord hanger.



- 26) Discard the 1 ¼" pieces and weld the cord hanger back together.



- 27) Using the four 3/8" X ¾" bolts you welded in place and four 3/8" hex head nuts, reattach the cord hanger in the cargo bay.



- 28) Using silicone, seal any open holes, any bolt or screw heads, and all stitched and welded sheet metal.
- 29) Using black high gloss paint any chipped, scratched parts inside the cargo bay.

Operator _____ Date _____

Supervisor _____ Date _____

Cabinet Shop Manager _____ Date _____

I.E. Manager _____ Date _____